



**UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/328,911	06/09/99	GELON	PA-98038

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PM82/0705

EXAMINER

BROADHEAD, B

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 07/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/328,911

Applicant(s)

GELON ET AL.

Examiner

Brian J. Broadhead

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 through 14, 16, 23, 24, 25, 26, 27, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Porte, p., "Benefits of Electrical Propulsion for Orbit Injection of Communication Spacecraft".

1. As per claims 1 and 23, Porte discloses launching a spacecraft; a spacecraft with chemical and electrical propulsion; and a solar; firing the chemical propulsion at the apogees of the intermediate orbits to raise the orbit to a geosynchronous; steering the thrust vector both in plane and out of plane while rotating the spacecraft body and steering the solar array to maintain the solar; firing the electric thrusters to raise the orbit from where the chemical thruster raised the; and selectively firing the chemical thruster all on page 2, columns 1-2.

2. As per claim 2, Porte discloses the thrust vector is maintained substantially normal to the axis of the solar array and the sun is normal to the solar array on page 2, column 2, paragraph 3 in section 3.2.

2. As per claims 3, 25, and 26, Porte discloses the thrust vector is not normal to the axis of the solar array and the thrust vector is controlled to provide sufficient solar power to perform maneuvers and minimize propellant use on page 6, column 1, section 3.4.3.

3. As per claims 4 and 5, Porte discloses that the transfer orbit is subsynchronous on line 45, on page, and supersynchronous on page 2, column 1.

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4. As per claims 6 and 24, Porte discloses the thruster firing profile is generated on board on page 5, column 1. It is disclosed that the spacecraft can be controlled on-board or from the ground.

5. As per claims 7, 8, 9, 25, 26, 27, and 29, Porte discloses control from the earth on page 5, column 1; the steering maintains the sun normal to the solar array in control strategy 1; the thrust vector is not normal to the axis of the solar array and the thrust vector is controlled to provide sufficient solar power to perform maneuvers and minimize propellant use in control strategy 2.

6. As per claims 10, 11, and 28, Porte discloses the spacecraft steering profile steers the thrust vector to maintain the sun normal to the solar in control strategy 1; and firing the electric propulsion to compensate for the disturbances page 5, column 1.

7. As per claims 12 and 13, Porte discloses a hybrid propulsion system to use both chemical and electric propulsion to achieve a geosynchronous orbit and to compensate for disturbances in section 3.4.3.

8. As per claims 14, 15 and 16, Porte discloses firing the electric propulsion thrusters to raise the orbit of the spacecraft comprises pre-planned electric thruster coast periods that are selectively shortened or lengthened in duration to compensate for disturbances on page 2, column 2. The apogee thrusting is done after a coasting period.

Claim Rejections - 35 USC § 103

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9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 17 through 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porte, p., "Benefits of Electrical Propulsion for Orbit Injection of Communication Spacecraft", in view of Hosick et al., 6032904.

11. Porte discloses all the limitations as set forth above. Porte does not disclose using momentum wheels, pointing the thrust or differential thrust away from the center of mass to provide control torque and raise the orbit; or using thruster on the north and south side of the spacecraft to decrease the duration of the orbit raising phase. Hosick et al. teaches of using momentum wheels in figure 1c, pointing the thrust or differential thrust away from the center of mass to provide control torque and raise the orbit in figures 14 and 15; or using thruster on the north and south side of the spacecraft to decrease the duration of the orbit raising phase in figure 11. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use these teachings of Hosick et al. in the invention of Porte because they are the conventional ways to control spacecraft. Momentum wheels are a known effective control that doesn't use fuel for control, and gimbaled thrusters are known as a way to reduce the necessary number of thrusters needed and to get the most thrust with the least amount of fuel because differential thrust can be reduced.

Response to Arguments

12. Applicant's arguments filed 6-14-01 have been considered and deemed persuasive. The discussion of the differences between the cited art and the claimed invention was useful. In view of these remarks a new rejection has been made. This new rejection cited art that describes several different method that are possible for raising an orbit with a hybrid propulsion system. The examiner finds that many of the dependant claims are standard control methods or hardware, i.e. momentum wheels, etc., that are conventional to the art and would be an obvious addition to any orbit raising method.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 703-308-9033. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A. Cuchlinski can be reached on 703-308-3873. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

BJB

June 28, 2001

Jaques H. Louis
JAQUES H. LOUIS/JAQUES
PRIMARY EXAMINER